

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 03 MAR 2005



WIPO PCT

Applicant's or agent's file reference K 2853 PCT	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/US2004/010889	International filing date (day/month/year) 07.04.2004	Priority date (day/month/year) 07.04.2003
International Patent Classification (IPC) or national classification and IPC C07C317/12, C07D295/26, C07D241/04, A61K31/18, A61K31/495, A61P3/06, A61P9/00		
Applicant KALYPSYS, INC. et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ sent to the applicant and to the International Bureau a total of sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 08.11.2004	Date of completion of this report 01.03.2005
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Goetz, G Telephone No. +49 89 2399-8105 

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2004/010889

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-70 as originally filed

Claims, Numbers

1-122 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing *(specify):*
 - ☐ any table(s) related to sequence listing *(specify):*
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing *(specify):*
 - ☐ any table(s) related to sequence listing *(specify):*

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
 - ☒ claims Nos. 100,102,104,106,108,110,112-115
because:
 - ☒ the said international application, or the said claims Nos. 110,102,104,106,108,110,112-115 relate to the following subject matter which does not require an international preliminary examination (specify):
see separate sheet
 - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
 - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
 - ☐ no international search report has been established for the said claims Nos.
 - ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
 - ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
 - ☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-122
	No: Claims	
Inventive step (IS)	Yes: Claims	87-91
	No: Claims	1-86, 92-122
Industrial applicability (IA)	Yes: Claims	1-99,101,103,105,107,109,111,116-122
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

- D1: WO 03/024395 A (JAPAN TOBACCO INC ; ABE HIROYUKI (JP); KAWASAKI HISASHI (JP); SPERRY S) 27 March 2003 (2003-03-27)
- D2: WILLSON T M ET AL: "The PPARs: From orphan receptors to drug discovery" JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. WASHINGTON, US, vol. 43, no. 4, 24 February 2000 (2000-02-24), pages 527-550, XP002956330 ISSN: 0022-2623

1. None of the prior art documents discloses para-sulfonyl-substituted phenyl compounds as claimed in present claims 1,74,87 or 90.
In particular D1 discloses one sulfonyl-compound (see compound 5 of figure 1a) which differs from the claimed compounds by the fact that the sulfonyl-group is connected directly to two phenyl-rings. This feature is excluded by the claimed compounds since G_2 cannot be an aromatic ring. In addition G_3 cannot be an alkoxy-group.
D2 discloses on page 534 one sulfonyl-compound where, in contrast to the claimed compounds, the carboxyl-group is missing.
The subject matter of present claims 1 to 122 is thus novel over said prior art (PCT Article 3.2).
2. The compounds of D1 and D2 are known modulators of peroxisome proliferator activated receptors (PPARs).
The underlying problem in view of D1/D2 is to be seen in the provision of further compounds which act as modulators of PPARs in particular of PPAR-delta.
The alleged solution of this problem is said to be represented by the compounds according to claims 1,74,87,90. The general formulae of these claims encompass a multitude of structurally different compounds.
In contrast to these general formula only a limited number of structurally very close compounds have been prepared and tested for their biological activity (see table two). These compounds have all following structural feature in common:
 $G_1 = -C(-CH_3)_2-O-$
 $G_2 =$ piperazine-ring
From the data given for these compounds it is evident that these compounds solve the underlying problem.
These compounds can be regarded as being obvious and equivalent alternatives to the compounds claimed in present claims 87 to 92.
Consequently the compounds claimed in claims 87 to 91 are considered to solve the underlying problem.

The subject matter of present claims 87 to 92 is thus considered to be based on an inventive step (PCT Article 33.3).

All other compounds falling within the scope of present formulae (I), (II) or (III) are structurally too remote to the tested compounds that they cannot be regarded as being equivalent and obvious alternatives. In the absence of further data these compounds are considered not to represent a solution to the underlying problem with the result that these compounds are not based on an inventive step.

The subject matter of present claims 1 to 86, 92 to 122 is thus not based on an inventive step (PCT Article 33.3).

3. For the assessment of the present claims 100,102,104,106,108,110,112-115 on the question whether they are industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

Claims 100,102,104,106,108,110,112-115 relate to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Article 34(4)(a)(I) PCT).